

PLT19 Maine State Supplement 2013-1

Herbicide resistant weed management

#2 -To meet the reduction in STIR value, the tillage intensity must be reduced and demonstrated by running the before and after scenario in RUSLE2. This may be accomplished different ways. Two methods might be use of reduced-till or no-till, or by including one full growing season of cover crop in the rotation.

#3 – See Mode of Action Chart,
http://www.glyphosateweedscrops.org/Info/MOA_060807.pdf

#4 – Use of Residual Herbicides along with burn-down herbicides

From Cornell - "Resistance Management Strategy

Two-pass programs assure excellent weed control and provide the option of using herbicides with different sites-of-action than that of glyphosate products. In the long run, this herbicide resistance management strategy will go a long way in delaying or preventing development of glyphosate-resistant weed populations. “

Corn and Soybean Herbicide Chart

Repeated use of herbicides with the same site of action can result in the development of herbicide-resistant weed populations.

This publication was designed for commercial printing, color shifts may occur on other printers and on-screen.

By Mode of Action (effect on plant growth)

This chart groups herbicides by their modes of action to assist you in selecting herbicides 1) to maintain greater diversity in

sites of action to delay the development of herbicide resistance.

	Site of Action Group*	Site of Action	Number of resistant weed species in U.S.	Chemical Family	Active Ingredient	Product Examples (Trade Name®)
Lipid Synthesis Inhibitors	1	ACCase Inhibitors (acetyl CoA carboxylase)	15	Aryloxyphenoxy propionate	fenoxaprop fluazifop quizalofop clethodim	component of Fusion Fusilade DX Assure II, Targa Select, Arrow
Amino Acid Synthesis Inhibitors	2	ALS Inhibitors (acetolactate synthase)	38	Sulfonylurea	chlorimuron foramsulfuron halosulfuron iodosulfuron nicosulfuron	Classic Option Permit Autumn Accent

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By Premix

This chart lists premix herbicides alphabetically by their trade names so you can identify the premix's component herbicides and their respective site of action groups. Refer to the **Mode of Action** chart for more information.

Premix Trade Name®	Trade Name®	Component Active Ingredient	Site of Action Group*
Authority First	Spartan FirstRate	sulfentrazone cloransulam	14 2
Axiom	Define Sencor	flufenacet metribuzin	15 5
Basis	Resolve Harmony GT	rimsulfuron thifensulfuron	2 2
Bicep II Magnum	Dual II Magnum AAtrex	s-metolachlor atrazine	15 5
Bicep Lite II Magnum....	Dual II Magnum AAtrex	s-metolachlor atrazine	15 5
Boundary	Dual Magnum	s-metolachlor	15
Breakfree ATZ.....	Breakfree	acetochlor atrazine	15 5
Breakfree ATZ Lite.....	Breakfree	acetochlor atrazine	15 5
Buctril + Atrazine	Buctril	bromoxynil atrazine	6 5
Bullet	Micro-Tech	alachlor atrazine	15 5
Camix	Callisto	mesotrione	28
Canopy DF	Dual II Magnum Classic Sencor	s-metolachlor chlorimuron metribuzin	15 2 5
Canopy EX	Classic Express	chlorimuron tribenuron	2 2
Celebrity Plus	Clarity	diflufenzopyr dicamba	19 4
Cinch ATZ	Dual II Magnum AAtrex	s-metolachlor atrazine	15 5
Cinch ATZ Lite	Dual II Magnum AAtrex	s-metolachlor atrazine	15 5

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Amino Acid Synthesis Inhibitors

Growth

(Synthetic auxins)

Photosynthesis Inhibitors

Nitrogen Metabolism

Pigment Inhibitors

9	EPSP Synthase Inhibitor (5-enolpyruvyl-shikimate-3-phosphate)	7	None accepted	glyphosate	<i>Roundup, Touchdown, others</i>
4	Specific site unknown	7	Phenoxy	2,4-D	<i>Weedone, others</i>
			Benzoic acid	dicamba	<i>Banvel, Clarity</i>
19	Auxin Transport	0	Semicarbazone	diflufenzopyr	component of <i>Distinct</i>
6	Photosystem II Inhibitors (different binding than 6 & 7)	22	Triazine	atrazine simazine metribuzin	<i>AAtrex, others</i> <i>Princep</i> <i>Sencor</i>
7	Photosystem II Inhibitors (different binding than 5 & 7)	1	Nitrile	bromoxynil	<i>Buctril, others</i>
			Benzothiadiazole	bentazon	<i>Basagran</i>
10	Glutamine Synthesis Inhibitor	7	Ureas	linuron	<i>Lorox, Linex</i>
13	Diterpene Synthesis Inhibitor	0	None accepted	glufosinate	<i>Liberty</i>
			Isoxazolidinone	clomazone	<i>Command</i>

Degree Xtra.....	<i>Degree</i>	acetochlor	15
	atrazine	atrazine	5
Distinct	diflufenzopyr	diflufenzopyr	19
	<i>Clarity</i>	dicamba	4
Domain	<i>Define</i>	flufenacet	15
	<i>Sencor</i>	metribuzin	5
Equip	<i>Option</i>	foramsulfuron	2
	<i>Autumn</i>	iodosulfuron	2
Expert	<i>Dual II Magnum</i>	s-metolachlor	15
	<i>AAtrex</i>	atrazine	5
	glyphosate	glyphosate	9
		glyphosate	9
Field Master	<i>Harness</i>	acetochlor	15
	atrazine	atrazine	5
	glyphosate	glyphosate	9
FulTime	<i>TopNotch</i>	acetochlor	15
	atrazine	atrazine	5
Fusion.....	<i>Fusilade DX</i>	fluazifop	1
Gangster.....	<i>Valor</i>	flumioxazin	14
	<i>FirstRate</i>	cloransulam	2
		atrazine	5
Guardsman Max	<i>Outlook</i>	dimethenamid-P	15
Harness Xtra.....	<i>Harness</i>	acetochlor	15
	atrazine	atrazine	5
Hornet	<i>Stinger</i>	clopyralid	4
	<i>Python</i>	flumetsulam	2
Keystone.....	<i>Surpass</i>	acetochlor	15
	atrazine	atrazine	5
Keystone LA	<i>Surpass</i>	acetochlor	15
	atrazine	atrazine	5
Laddok.....	<i>Basagran</i>	bentazon	6
	atrazine	atrazine	5
Lexar.....	<i>Callisto</i>	mesotrione	28
	<i>Dual II Magnum</i>	s-metolachlor	15
	<i>AAtrex</i>	atrazine	5
Lightning	<i>Pursuit</i>	imazethapyr	2
Lumax.....	<i>Callisto</i>	mesotrione	28
	<i>Dual II Magnum</i>	s-metolachlor	15
	<i>Aatrex</i>	atrazine	5
Marksman.....	<i>Banvel</i>	dicamba	4
	atrazine	atrazine	5

Pigment Inhibitors

28

HPPD Inhibitors

0

Isoxazole

isoxaflutole

Balance Pro

Triketone

mesotrione
tembotrione
tropolamezone

**Callisto
Laudis
Impact**

14

PPO Inhibitors

2

Diphenylether

acifluorfen
fomesafen
lactofen

**Ultra Blazer
Flexstar, Reflex
Cobra, Phoenix**

N-phenylphthalimide

flumiclorac
flumioxazin

**Resource
Valor SX**

Aryl triazinone

sulfentrazone
carfentrazone

**Spartan
Aim**

22

Photosystem I Electron Diverter

4

Bipyridilium

paraquat

Gramoxone Inteon

3

Microtubule Inhibitors

6

Dinitroaniline

ethalfluralin
pendimethalin
trifluralin

**Sonalan
Prowl, others
Treflan, others**

8

Lipid Synthesis Inhibitors (not ACCase)

5

Thiocarbamate

butylate
EPTC

**Sutan +
Eradicane**

15

Long-chain Fatty Acid Inhibitor

1

Chloroacetamide

acetochlor

**Harness, TopNotch,
Degree, others** alachlor
**Intro, Micro-Tech
Dual II Magnum, others**

metolachlor
dimethenamid

Define

Oxyacetamide

flufenacet

Seedling Root Growth Inhibitors

Seedling Shoot Growth Inhibitors

* **Site of Action Group** is a classification system developed by the Weed Science Society of America

Glyphosate, Weeds, and Crop Series

GWC-3

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NorthStar	Beacon Clarity	primisulfuron	2	
Parallel Plus.....	Parallel	dicamba	4	
Priority	Aim	metolachlor	15	
Prefix	Permit	atrazine	5	
Pursuit Plus	Dual Magnum Reflex	carfentrazone	14	
Radius	Pursuit	halosulfuron	2	
Sequence	Prowl	s-metolachlor	15	
Shotgun	Define	fomesafen	14	
Sonic.....	Balance Pro	imazethapyr	2	
	Dual Magnum	pendimethalin	3	
	Salvo	flufenacet	15	
	Spartan	isoxaflutole	28	
	FirstRate	s-metolachlor	15	
		glyphosate	9	
		atrazine	5	
		2,4-D	4	
		sulfentrazone	14	
		cloransulam	2	
Stalwart Xtra	Beacon	primisulfuron	2	
	Stalwart C	metolachlor	15	
	atrazine	atrazine	5	
Status	Clarity	atrazine	5	
	Resolve	dicamba	4	
Steadfast	Accent	nicosulfuron	2	
	Resolve	rimsulfuron	2	
Steadfast ATZ	Accent	nicosulfuron	2	
	Resolve	rimsulfuron	2	
	Harmony GT	atrazine	5	
Stout	Accent	nicosulfuron	2	
	Harmony GT	thifensulfuron	2	
SureStart	Surpass	acetochlor	15	
	Stinger	clopyralid	4	
	Python	flumetsulam	2	
Synchrony	Classic	chlorimuron	2	
	Harmony GT	thifensulfuron	2	
Valor XLT	Valor	flumioxazin	14	
	Classic	chlorimuron	2	
Volley ATZ.....	Volley	acetochlor	15	
	atrazine	atrazine	5	
Volley ATZ Lite	Volley	acetochlor	15	
	atrazine	atrazine	5	
Yukon.....	Banvel	dicamba	4	
	Permit	halosulfuron	2	



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